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THE ADULT AND IMMATURES OF *RUSSOBEX* GEN. NOV., A NEW MONOTYPIC GENUS FROM VICTORIA (TRICHOPTERA : LEPTOCERIDAE)

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Abstract: *Russobex* gen. nov. is erected to accommodate a single leptocerid species, *R. cuneatus* gen. et sp. nov. Descriptions of adults and immatures are given and the affinities of the genus and its position in Morse's (1981) phylogeny of the Leptoceridae are discussed briefly.

The Leptoceridae is a cosmopolitan family of Trichoptera that is widespread and diverse throughout Australia (Neboiss 1986), with the larvae occurring in a wide range of water bodies. There are 14 genera of Leptoceridae in Australia representing both subfamilies: Leptocerinae Leach and Triplectidinae Ulmer. A new genus and species of Leptocerinae, *Russobex cuneatus* gen. et sp. nov., is described here in adult, pupal and larval stages.

The terminology for the adult morphology follows that of Holzenthal (1986), where applicable; for the pupal morphology, Wiggins (1984 pp. 227,228); and for larval morphology, Wiggins (1977 pp. 26-34).

Russobex gen. nov.
Adults Figs 1 & 2

Diagnosis: Spur formula 2:2:3; anterior wing with forks 1 and 5 present, discoidal cell short, thyridial cell open; posterior wing with forks 1 (very narrow) and 5 present, fork 3 and discoidal cell absent.

Male genitalia: inferior appendages each with a long dorsal process, a shorter ventral process and a large mesal process; a fringe of pale but strong setae present ventrally from part way along each inferior appendage extending almost to the midline, each seta on a raised sclerotised base; segment X short, deep and broad; phallobase dorsally with a selerite ending in two stout, upwardly- and outwardly-turned points, parameres absent, sclerotised strips (as used by Morse 1977) absent.

Female genitalia: segment IX with a lateral "pocket" on each side.

Remarks: The absence of the discoidal cell and fork 3 in the posterior wing places this genus in the Leptocerinae. It shows no close affinity to any particular genus in this subfamily. The absence of phallic strips (Morse 1975) and the spur formula 2:2:3 suggest that this genus should be placed prior to Athripsidini in the phylogeny described by Morse (1981), as both reduction of the spur formula from 2:2:4 to 2:2:2 and development of the phallic selerotised strips are presumed to have occurred in the ancestor at the node from which Athripsidini arose. This places *Russobex* very early in the leptocerid lineage, near *Leptorussa* (Mosely). However, the preanal appendages and segment X are much shorter and broader than in *Leptorussa* and the inferior appendages are long and three branched in *Russobex* as opposed to short and two branched in *Leptorussa*. Morse (1981) considered *Leptorussa* to be modified due to this loss of the third branch (Harpago). Presence of the third branch indicates *Russobex cuneatus* does not belong in *Leptorussa*.

Morse (1981) suggests that Australia was effectively isolated from the other habitable land masses between the times of the Leptorussini node and the Leptocerini node. *Russobex* presumably was contemporaneous with or arose from an ancestor which was present prior to the isolation of Australia. Further discussion of the position of this genus in the phylogeny of Morse (1981), using information from larval characters, will be given in a later paper.

Type Species: *Russobex cuneatus* sp. nov.

Russobex cuneatus sp. nov.
Adults Figs 1 & 2.

Holotype: Male from Upper Macalister R., above Howitt Plains, 146 39'E; 37 13'S, A. A. Calder 25.ii.1979. Paratypes: 19 males including PT-963, PT-964, PT-966, PT-947, 16 females including PT-968, all from the same locality and date as the holotype, reared paratypes (i.e. adult, pupal skin, larval skin and case) PT-969 (male) and PT-965 (female), same locality as holotype but labelled 5 km S of Mt Howitt, 18.xi.1985.

Description: Anterior wings as shown in Fig. 1G, length 4-5 mm, pale fawn in alcohol, with some very pale spots; posterior wings paler with a long setal fringe on posterior margin, fringe decreasing in length distally; venation in distal anterior region very weak. Some specimens with some setae on posterior margin of anterior wings; female wings similar to those in male. Abdomen pale brown dorsally and ventrally, laterally with a cream stripe, female paler than male.

Male genitalia: As shown in Fig. 1A-F; preanal appendages short and broad; a pair of membranous

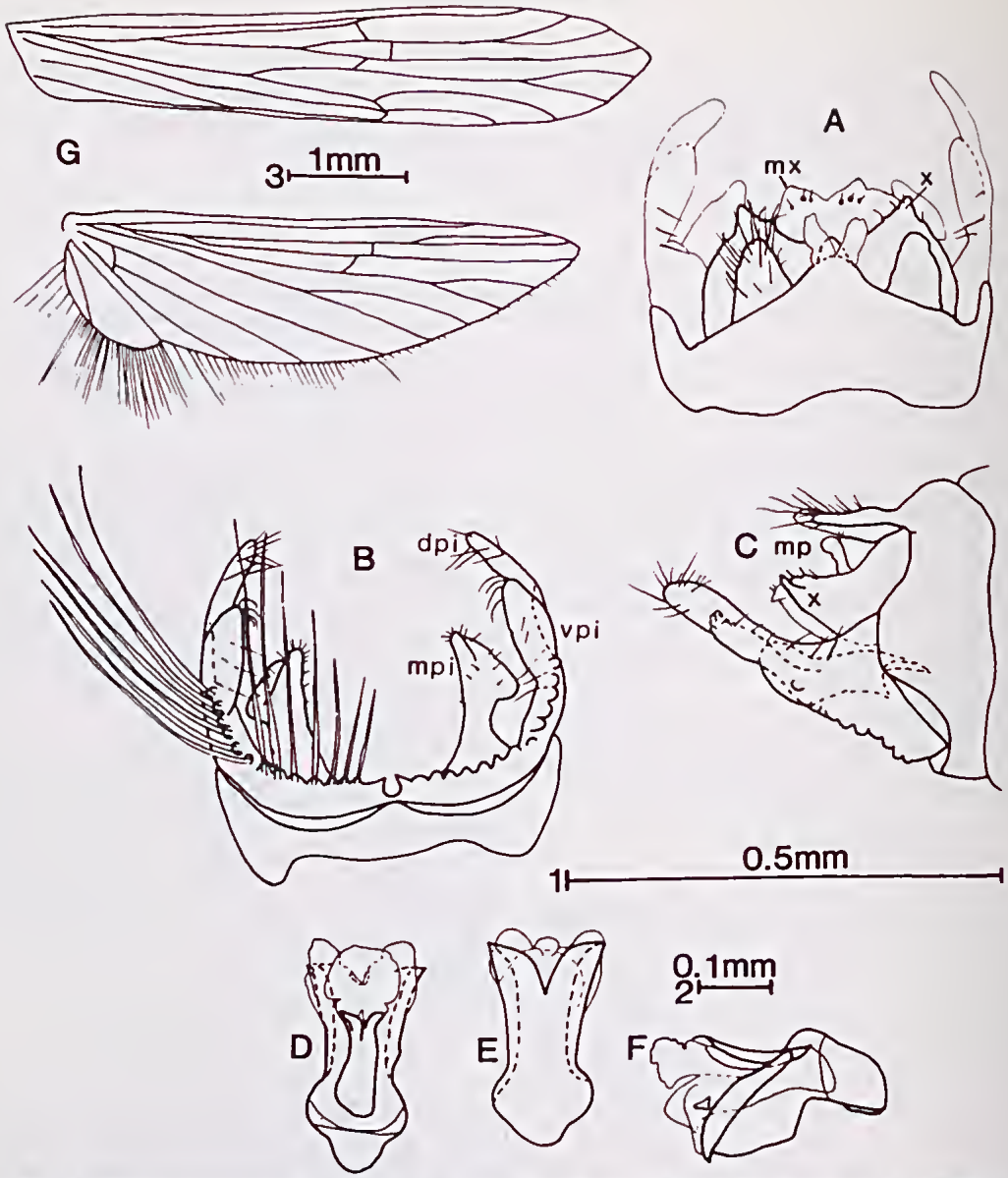

Fig. 1—*Russobex cuneatus* gen. et sp. nov. adult male (PT-964 A-F and PT-968 G). A-F, genitalia. A, dorsal. B, ventral. C, lateral. D, phallic apparatus, dorsal. E, phallic apparatus, ventral. F, phallic apparatus, lateral. G, wings. mp, membranous rounded projection; x, segment X, mx, membranous area of segment X; vpi, ventral processes of inferior appendage; dpi, dorsal process of inferior appendage; and, mpi, mesal process of inferior appendage. A-C, scale 1; D-F, scale 2; G, scale 3.

papillae medially between the preanal appendages; below the membranous papillae a membranous rounded projection with slightly-sclerotised lateral ridges, two small setae on top of the ridge; segment X strongly-divided dorsally into two lateral, sclerotised lobes, each brought to a strongly-sclerotised tip distally, these lobes joined medially and ventrally by a membranous area; inferior appendages long, ventral processes with apical setae strongly recurved; mesal process of inferior appendage broadened distally; segment IX laterally widest medially, ventral third of lateral margin usually close to lateral margin of inferior appendage; phallus dorsally with a long sclerite ending in two stout, upwardly- and outwardly-pointing tips that support a rounded membranous area, phallobase with a strongly-sclerotised, inward-turned, lateral extension on each side; a small phallotremal sclerite present.

Female genitalia: As shown in Fig. 2A-C; valves long, narrow dorsally, deep laterally; laterally on each side a sclerotised concavity with finely-setose margins ("pocket"); each side with a lightly-sclerotised plate from the dorsal margin of the sclerotised concavity, a second, less-sclerotised plate on each side between

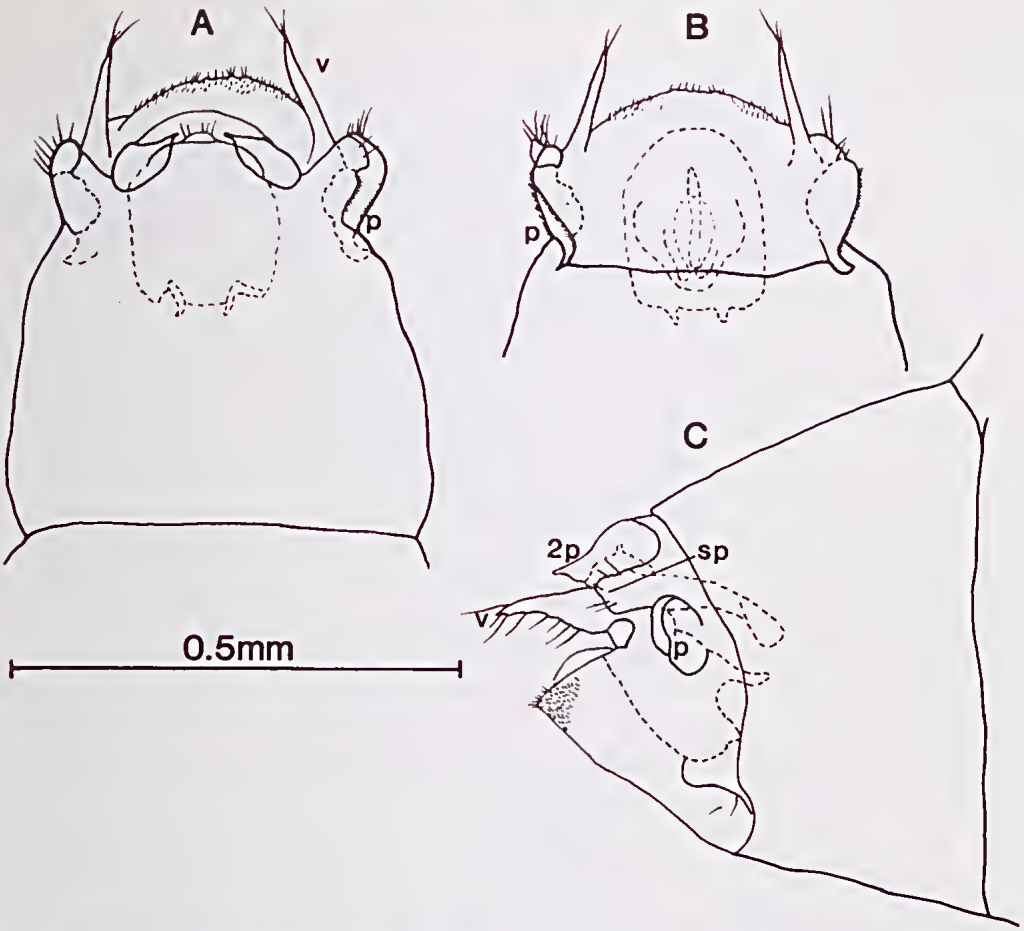

Fig. 2—*Russobex cuneatus* gen. et sp. nov., adult female genitalia (PT-965). A, dorsal. B, ventral. C, lateral. v, valves; p, "pocket"; sp, sclerotised plate; 2p, second sclerotised plate; and, ps, pear-shaped sclerite.

the first plate and the valve; mid-dorsally a small, approximately pear-shaped sclerite on each side, narrow ends pointing medially; vaginal apparatus complex; ventrally a pair of pale sclerites medially adjacent to posterior margin of segment.

ETYMOLOGY: *Russobex* is formed by the combination of "russ" from *Leptorussa*, the other primitive Australian leptocerine genus, and "obex", Latin for a barrier, referring to the fringe of setae ventrally on the male genitalia. The species name, *cuneatus*, is from the latin for wedge-shaped and refers to the shape of the larval head.

Russobex cuneatus
Pupae Fig. 3

DESCRIPTION: *Head*: Labrum elongate, semicircular anteriorly, with 16 setae; mandibles broad medially with a comb of teeth on inner margin; antennal bases each with two short setae.

Thorax: Pronotum with few setae; fore- and mid-legs with setal swimming fringes.

Abdomen: Lateral line very pale, obvious but pale on segment VIII ventrally; anterior hookplates all about the same length, with 2-4 hooks, posterior hookplates with about 5 hooks, plates rarely fused as shown in Fig. 3E; segment IX dorsally with four setae on each side; laterally without projections, ventrally without setae; anal opening on a shallow rounded projection, males with long, inferior-appendate sheaths extending past the end of the body, between their bases a bulbous, phallic sheath divided anteriorly; anal processes long, very thin particularly distally, each with two subapical setae and minutely setose.

Body length: 3.5-4 mm.

Case: Prior to pupation, the larval case is blocked anteriorly by a silk and sand cap. The posterior closure membrane (Fig. 3F) is a silk screen with an opening with narrow irregular arms, sometimes with some sand grains incorporated. Larval sclerites usually retained in the case. The case may be attached by short silk stalks or by the silk side of the case, without sand grains, just below the anterior cap.

Russobex
Final Instar Larvae

DIAGNOSIS: Antennae long, about ⅓ the width of the frontoclypeal apotome at the anterior margin; eye further posterior than in other Australian Leptoceridae

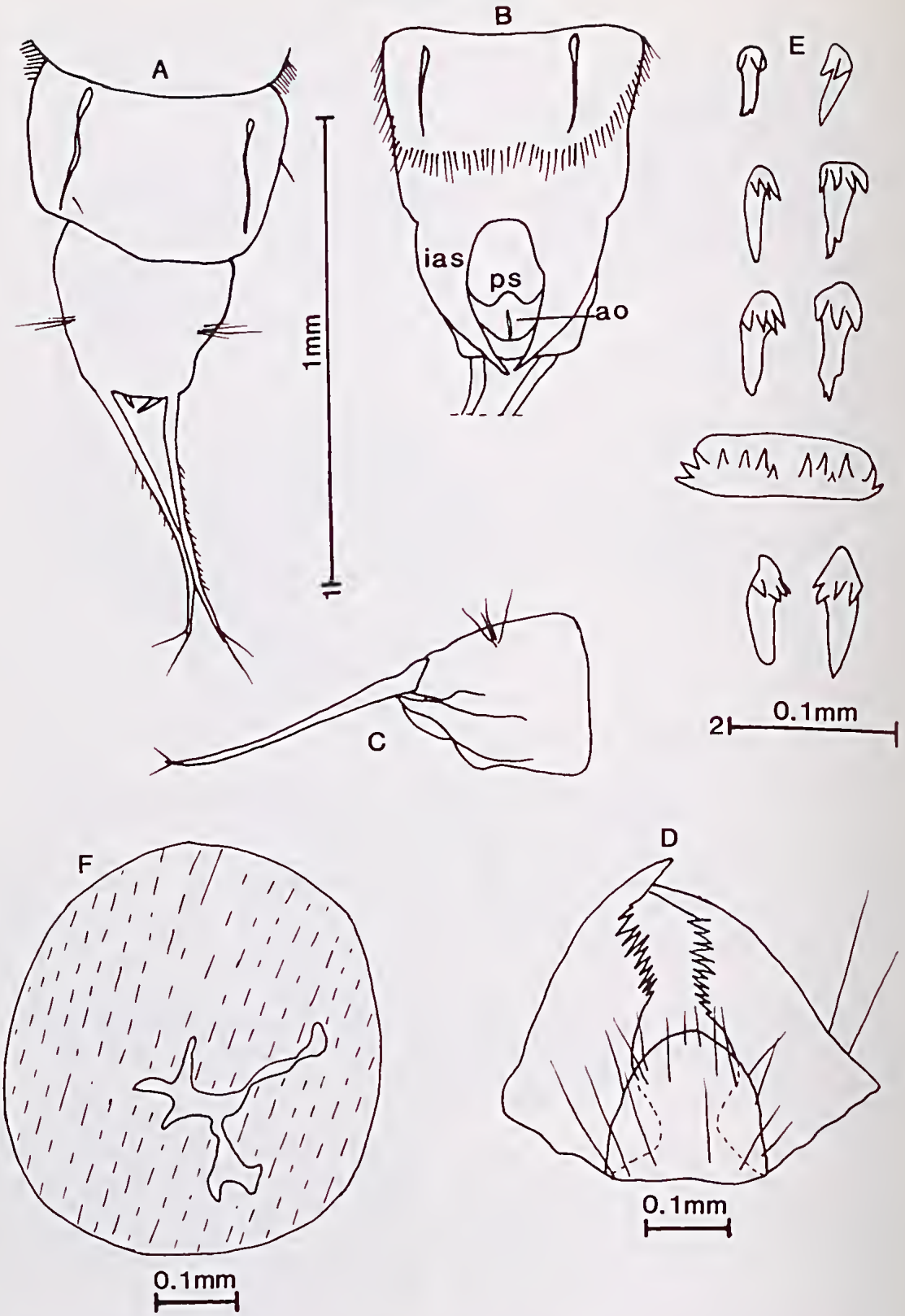

Fig. 3—*Russobex cuneatus* gen. et sp. nov., pupa (PT-890). A, segments VIII and IX dorsal. B, segments VIII and IX ventral. C, segment IX lateral. D, mandibles and labrum, dorsal view. E, hookplates. F, case, posterior closure membrane. A-C, scale 1; E, scale 2; D and F, scale as indicated. ias, inferior appendage sheath; ps, phallous sheath; and, ao, anal opening.

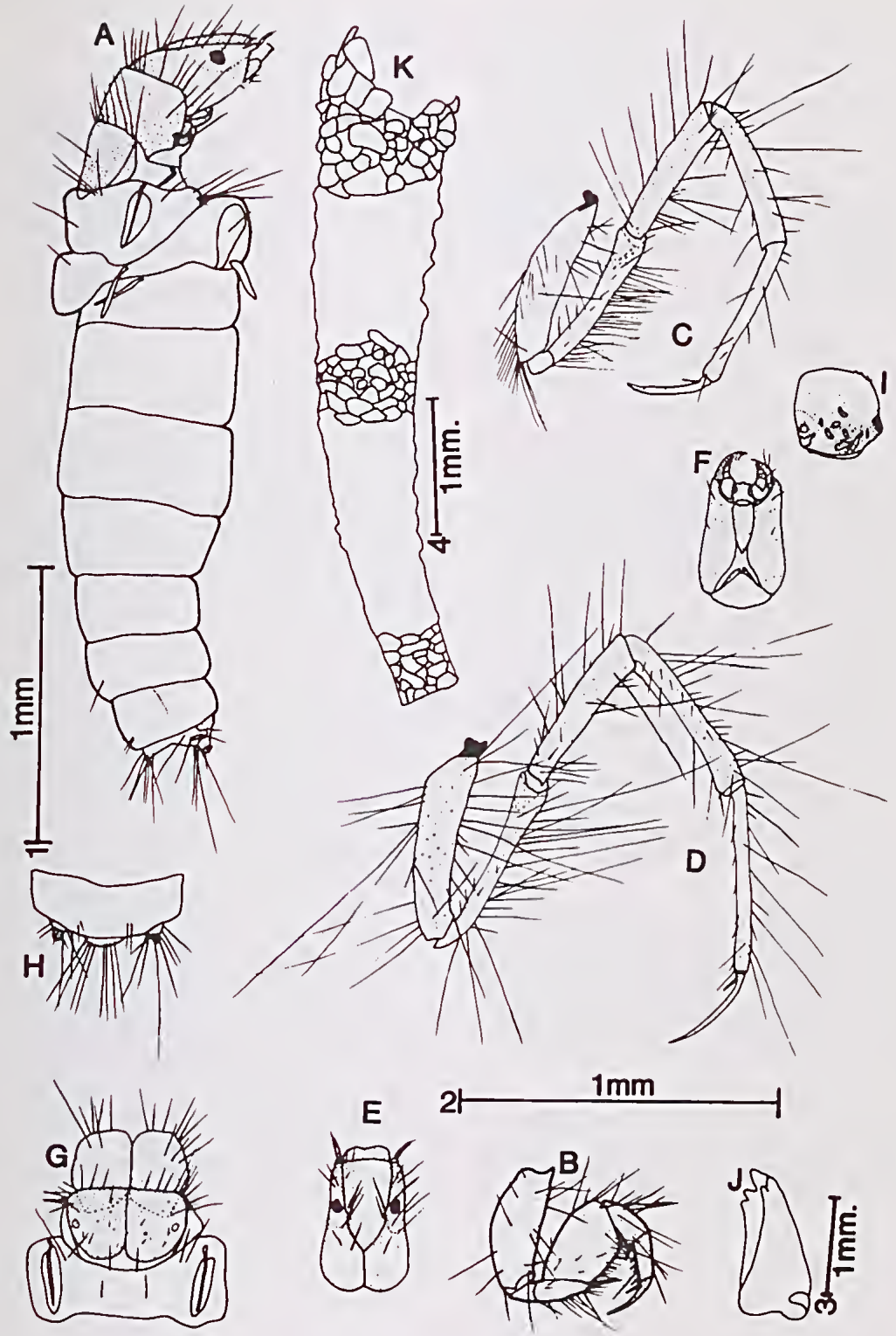

Fig. 4—*Russobex cuneatus* gen. et sp. nov., larva (PT-890 A-H, PT-891 I). A, body lateral. B, right foreleg. C, right midleg. D, right hindleg. E, head dorsal. F, head ventral. G, thorax dorsal. H, segments VIII and IX dorsal. I, right pronotal sclerite. J, left mandible. K, case (showing only some detail). A, E-I, scale 1; B-D, scale 2; J, scale 3; K, scale 4.

(except *Triplexa* Mosely); ventral apotome strongly tapering, almost as long as the head capsule ventrally; labrum with few setae; mandibles elongate, about twice as long as wide with teeth clustered around a narrow, central concavity (Fig. 4J); left mandible with two very short brushes of setae in the central concavity; pronotum with anterior margin almost straight but with a few tiny projections, anterolateral corner rounded with few very small projections; metanotum not sclerotised; metasternum with a posterior transverse row of about 14 setae, without sclerites at their base; hind tibia undivided; gills few, filaments single; tergum IX with eight long setae; unusually small larvae, about 2 mm.

Russobex cuneatus
Final Instar Larvae
Fig. 4.

DESCRIPTION: *Head*: Width 0.27 mm. (n = 1); elongate, narrowing anteriorly both dorsoventrally and laterally (wedge-shaped); honey brown, a pale area on posterolateral margin on some specimens; frontoclypeal apotome widest at anterior margin, shallow constriction at about ⅔ its length; left mandible with five or six teeth, right mandible with four teeth; setae on head long but pale.

Thorax: Pronotum honey brown, darker posteriorly with some lightly-contrasting spots (see Fig. 4I, this area usually under mesonotal sclerites); mesonotum brown, darker than head and pronotum, with a few pale-yellow, lightly-contrasting spots; metanotum with a seta in setal area 1, one in setal area 2 and two in setal area 3; dorsal setae mostly pale; trochantin moderately long with a short, upturned section; legs honey coloured with pale setae; foreleg with femur broadened; midleg much longer than foreleg, almost as long as hindleg.

Abdomen: Lateral hump sclerite very pale, difficult to see; gills dorsal and ventral on segment I, in some specimens also dorsal on segment II; lateral line not apparent; spicules faint; segment IX very short, tergite not apparent; lateral sclerite and ventral sole plate pale yellow; anal claw small, with at least one accessory hook.

Body Length: 1.5-2.5 mm (n = 8).

Case: The case is made of sand grains and is tapered, curved and comparatively broad anteriorly. The case is usually about 1½ times as long as the larva.

OTHER SPECIMENS EXAMINED: 47 adult males, 7 adult females, 14 reared males, 6 reared females, 8 larvae (reared specimens usually include the larval sclerites, pupal skin, case and adult).

COLLECTING LOCALITIES: Victoria: Macalister R. 5 km S of Mt Howitt (type locality) 18.xi.1985; Upper Macalister R. above Howitt Plains 146 39'E; 37 13'S (type locality), A. A. Calder, 25.ii.1979, Survey Dept Museum of Victoria, 22.ii.1978; Macalister R. 3 km S of Mt Howitt; Matlock Crk off Thomson Portal Rd, 14 km W of Aberfeldy, A. A. Calder 10.ii.1977.

HABITAT: Fast, cool, mountain streams.

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